Pelorosaurus

Pelorosaurus (/pəˌlɒrəʊˈsɔːrəs/ *pə-LORR-oh-SOR-əs*; meaning "monstrous lizard") is a genus of titanosauriform sauropod dinosaur. Remains referred to *Pelorosaurus* date from the Early Cretaceous period, about 140-125 million years ago, and have been found in England and Portugal. Thomas Holtz estimated its length at 24 meters (79 feet).[1]

The name *Pelorosaurus* was one of the first to be given to any sauropod. Many species have been assigned to the genus historically, but most are currently considered to belong to other genera. Problematically, the first named species of *Pelorosaurus*, *P. conybeari*, is a junior synonym of *Cetiosaurus brevis*.

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History

BMNH R28633, one of nine caudal vertebrae in 1853 referred by Owen to *P. conybeari*

Pelorosaurus was the first sauropod to be identified as a dinosaur, although it was not the first to be discovered. Richard Owen had discovered *Cetiosaurus* in 1841 but had incorrectly identified it as a gigantic sea-going crocodile-like reptile.[2] Mantell identified *Pelorosaurus* as a dinosaur, living on land.

The taxonomic history of *Pelorosaurus* and *Cetiosaurus*, as noted by reviewers including Michael P. Taylor and Darren Naish, is highly confusing. In 1842, Richard Owen named several species of *Cetiosaurus*. Among them was *Cetiosaurus brevis*, based

Pelorosaurus

Temporal range: Early Cretaceous, 132 Ma

Pre€ € O S D C P T J K PgN

Holotype humerus

Scientific classification	
Kingdom:	Animalia
Phylum:	Chordata
Clade:	Dinosauria
Clade:	Saurischia
Suborder:	†Sauropodomorpha
Clade:	†Sauropoda
Family:	†Brachiosauridae
Genus:	†*Pelorosaurus* Mantell, 1850
Species:	†***P. brevis***
Binomial name	

on several specimens from the early Cretaceous Period. Some of these, four caudal vertebrae, BMNH R2544–2547, and three chevrons, BMNH R2548–2550, found around 1825 by John Kingdon near Cuckfield in the Tunbridge Wells Sand Formation of the Hastings Beds, belonged to sauropods. Others however, including BMNH R10390, found near Sandown Bay on the Isle of Wight, and BMNH R2133 and R2115, found near Hastings, actually belonged to some iguanodont. Noticing Owen's mistake in assigning iguanodont bones to *Cetiosaurus*, comparative anatomist Alexander Melville renamed the sauropod bones *Cetiosaurus conybeari* in 1849.[3][4]

†***Pelorosaurus brevis*** (Owen, 1842)
Synonyms
▪ *Cetiosaurus brevis* Owen, 1842 ▪ *Cetiosaurus conybeari* Melville, 1849

In 1850, Gideon Mantell decided that *C. conybeari* was so different from *Cetiosaurus* that it needed a new genus, so he reclassified it under the new name *Pelorosaurus conybeari*. Mantell had originally, in November 1849, intended to use the name "Colossosaurus", but upon discovering that *kolossos* was Greek for "statue" and not "giant", he changed his mind. The generic name is derived from the Greek *pelor*, "monster". He also emended the specific name (honouring William Conybeare) to *conybearei*, but under the present rules of the ICZN, the original *conybeari*, today written without a capital, has priority. Mantell not only used the sauropod material of *C. brevis* as the type of *Pelorosaurus conybeari* but also a large humerus found by miller Peter Fuller at the same site, BMNH 28626, which he assumed to have been of the same individual, being discovered only a few metres away from the vertebrae. Mantell acquired the bone for £8. The humerus, clearly shaped to vertically support the weight of the body and presumed to possess a medullary cavity, showed that *Pelorosaurus* was a land animal. This was a main motive in naming a separate genus; shortly afterwards, however, by studying the sacral vertebrae of *Cetiosaurus* Mantell established that it too lived on land.[5]

The caudal sauropod vertebrae that form the type specimen of *C. brevis*

Owen was highly piqued by Melville's and Mantell's attempts to "suppress" his *Cetiosaurus brevis*. By a publication in 1853 he tried to set matters straight, as he saw it, while avoiding having to openly admit his original mistake. First he suggested that Melville's main motivation for the name change was the presumed inaccuracy of the epithet *brevis*, "short", because the total length of the animal could not be deduced from such limited remains. Owen pointed out that anyone being acquainted with taxonomy would have understood that "short" referred to the vertebrae themselves, not to the animal as a whole. On a subsequent page, apparently separate from this issue, Owen in covert terms implied that his 1842 publication was not descriptive enough, thus merely having resulted in a *nomen nudum*, to which he now assigned the sauropod material, making *Cetiosaurus brevis* a valid name. This still left the problem of it having been named a new genus by Mantell. Owen resolved it by simply presenting the humerus as the sole holotype of *Pelorosaurus conybeari*.[6] Remarkably, in 1859 he repeated his mistake by again referring iguanodontid vertebrae, specimens BMNH R1010 and R28635, to *C. brevis*.[7] The last of these he had in 1853 proposed to belong to *Pelorosaurus* together with a number of other iguanodontid vertebrae because Mantell had once labelled them as such in his collection; Owen suggested it had been by a mere mistake that the name *Pelorosaurus* had been connected with the *C. brevis* material instead of with these finds.[6]

Owen's interpretation was commonly accepted until well into the twentieth century. By 1970 however, both John Ostrom and Rodney Steel understood that Owen's claim that *C. brevis* in 1842 was still a *nomen nudum* should be rejected as a transparent attempt to change the type specimen, inadmissible by present standards. By those same standards though, Melville's name change was also incorrect: as the name *Cetiosaurus brevis* was still "available" he should simply have made the sauropod bones the lectotype, removing the iguanodontid remains from the syntype series. The sauropod bones, not the iguanodont bones, would then have retained the

name *C. brevis*. Therefore, *Cetiosaurus conybeari* is a junior objective synonym of *C. brevis*, that is, *C. brevis* is not only an older name, but one based on exactly the same fossils as the younger, invalid name.[4]

After 1850, more specimens continued to be assigned to both *Pelorosaurus* and *Cetiosaurus*, and both were studied and reported on extensively in the scientific literature.[4] Slowly a tendency developed to subsume fragmentary sauropod material from the Jurassic of England under the designation *Cetiosaurus*, while assigning incomplete European Cretaceous sauropod finds to *Pelorosaurus*. *Pelorosaurus* thus came to be a typical wastebasket taxon for any European sauropod of this period. However, in recent years much work has been done to rectify the confusion.

Fanciful 1914 restoration of *Pelorosaurus* by Vincent Lynch

Classification

The validity of *Pelorosaurus* is problematic. *P. conybeari* was based on a separately discovered humerus and vertebrae. However, these specimens might not belong to the same animal. *P. conybeari* is also a junior synonym of the older name *Cetiosaurus brevis*. In 2007, Michael P. Taylor and Darren Naish stated their intention to petition the International Commission on Zoological Nomenclature (ICZN) in order to designate the more widely used name *P. conybeari* the type species of *Pelorosaurus* and officially abandon the name *c. brevis*.[8] However, the issue of the *Pelorosaurus* type species did not end up as part of their petition when it was officially filed and accepted.[9]

Many species have later been assigned to *Pelorosaurus*, most of which today are considered different dinosaurs. One notable species, *P. becklesii*, was known from a humerus, radius and ulna, as well as skin impressions. This specimen has since been made the new genus *Haestasaurus*.

Valid species

- *Cetiosaurus brevis* Owen 1842
  - **Synonyms:**
  - *Cetiosaurus conybeari* Melville 1849
  - *Pelorosaurus conybearei* (Melville 1849) Mantell 1850
  - *Pelorosaurus brevis* (Owen 1842) Huene 1927
  - *Ornithopsis conybearei* (Melville 1849) Huene 1929

Dorsal vertebra assigned to *Cetiosaurus brevis*

Misassigned species

- *P. becklesii* Mantell 1852 = *Haestasaurus becklesii*
- *P. manseli* Hulke in Lydekker 1888 (*nomen dubium*) = *Ischyrosaurus manseli*
- *P. humerocristatus* (Hulke 1874) Sauvage 1887 = *Duriatitan humerocristatus*.
- *P. armatus* (Gervais 1852) Lydekker 1889 = *Oplosaurus armatus*
- *P. hulkei* (Seeley 1870) Lydekker 1889 = *Ornithopsis hulkei*
- *P. leedsii* (Hulke 1887) Lydekker 1890 (*nomen dubium*) = *Ornithopsis leedsii*
- *P. praecursor* (Sauvage 1876) Sauvage 1895 = *Neosodon praecursor*

- *P. mackesoni* (Owen 1884) Steel 1970 (*nomen dubium*) = *Dinodocus mackesoni*
- *P. megalonyx* (Seeley 1869) Huene 1909 (*nomen dubium*) = *Gigantosaurus megalonyx*

Relationships

Recreation

Mantell was the first to suggest a relationship between *Pelorosaurus* and dinosaurs. In 1852 Friedrich August Quenstedt formally listed it in the Dinosauria.[10] Predictably, Owen at first rejected this classification, still in 1859 considering it a member of the Crocodilia.

Holotype humerus lithograph

In 1882 Henri-Émile Sauvage first stated it belonged to the Sauropoda. That group being still very incompletely known however, it proved difficult to determine its more precise affinities, with the Atlantosauridae, Cardiodontidae, Cetiosauridae and Morosauridae being suggested until in 1927 von Huene understood the possible link with *Brachiosaurus*, placing *Pelorosaurus* in the Brachiosauridae, a placement followed by subsequent authors until the early 21st century. The humerus, 137 centimeters long and very elongated, strongly suggests a typical brachiosaurid trait was present: the possession of relatively long front limbs. The uncertainties about whether the qualities of the vertebrae or the humerus should be analysed, both specimens not necessarily belonging to the same taxon, prevents any firm conclusion to be reached, however. In recent years, the material was commonly placed in a more general Titanosauriformes.

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